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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,657	09/17/2003	Hiroki Awakura	501.43143X00	3803
20457 7590 05/21/2010 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873				
EXAMINER BODDIE, WILLIAM				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/663,657

Applicant(s)

AWAKURA ET AL.

Examiner

WILLIAM L. BODDIE

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 11-18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

1. In an amendment dated, February 12th, 2010 the Applicants traversed the rejection of claims 1-10. Currently claims 1-10 are pending.

Response to Arguments

2. Applicant's arguments filed February 12th, 2010 have been fully considered but they are not persuasive.

On pages 4-6 of the Remarks, the Applicants argue that Ishizuka does not expressly disclose the last phrase of independent claim 1. Specifically arguing that Ishizuka is silent as to modulating the amount of current according to the light-emission or frame.

3. The Examiner respectfully disagrees. The Applicants are directed to column 19, lines 14-15 of Ishizuka, which expressly states that the measurement routine can be executed in intervals between subfields. This would seem to clearly fall within the broadest reasonable definition of "within said each frame period." To further explain Ishizuka details a measurement routine which modulates the amount of current applied in-between subfields of a frame. This is seen as sufficient disclosure to teach modulating the current within each frame period, said current being output from said current source.

It appears that the Applicants may be imparting additional limitations onto the claims which are not present. It is important to note that there is no current requirement that current modulation be performed while image data is supplied to the pixels. Likewise there is no requirement that the current be modulated based on the light-

Art Unit: 2629

emission or frame. All that is currently required is that the current be modulated within each frame period.

As discussed above, the rejections of claims 1-10 are seen as proper and are thus maintained in the current office action.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 5 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishizuka et al. (US 7,264,363).

With respect to claim 1, Ishizuka discloses, a display apparatus comprising;

a pixel array including a plurality of pixels ($PL_{n,m}$ in fig. 15), each pixel including:

a light emitting unit (15 in fig. 2),

a drive element for controlling supply of a current to said light emitting unit (12 in fig. 2), and

a switching element (11 in fig. 2) for controlling said drive element according to an image signal (col. 1, line 63 – col. 2, line 18, for example);

a data signal drive circuit (24 in fig. 15) for receiving image data for each frame period and outputting said image signal to said pixel array based on said image data

(col. 18, lines 5-9), said each frame period being provided for displaying one screen of said image data (fig. 5);

a scanning signal drive circuit (25 in fig. 15) for outputting a scanning signal to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal (col. 18, lines 1-4); and

a current source (27 in figs. 15-16) for, through said drive element (fig. 2, for example), outputting said current supplied to said light emitting unit (col. 18, lines 21-23);

wherein said current source modulates the value or the amount of said current within said each frame period (col. 19, lines 14-15), said current being output from said current source (col. 18, lines 34-67).

With respect to claim 2, Ishizuka discloses, the display apparatus as claimed in claim 1 (see above), wherein:

said pixel array includes a pixel for red, a pixel for green, and a pixel for blue (col. 13, lines 32-45, for example); and

said current source is provided for each of said pixel for red, said pixel for green, and said pixel for blue separately (fig. 9).

With respect to claim 3, Ishizuka discloses, the display apparatus as claimed in claim 1 (see above), wherein said current source controls said value or said amount of said current according to a control signal input to said current source (col. 18, lines 46-63; control signal judging indicates how much current offset to apply).

With respect to claim 5, Ishizuka discloses, the display apparatus as claimed in claim 3 (see above), further comprising:

a control circuit (32-36 in fig. 16) for detecting said value or said amount of said current (col. 18, lines 34-45) and, based on said value or said amount of said current, generating said control signal input to said current source (col. 18, lines 46-67).

With respect to claim 10, Ishizuka discloses, a method for display an image based on image data by use of a pixel array including a plurality of pixels ($PL_{n,m}$ in fig. 15), each pixel including:

a light emitting unit (15 in fig. 2);

a drive element for controlling supply of a current to said light emitting unit (12 in fig. 2); and

a switching element (11 in fig. 2) for controlling said drive element according to an image signal (col. 1, line 63 – col. 2, line 18, for example);

wherein said method comprises the steps of:

outputting said current from said current source to said light emitting unit through said drive element (col. 18, lines 21-23);

receiving said image data for each frame period and outputting said image signal from a data signal drive circuit to said pixel array based on said image data (col. 18, lines 5-9), said each frame period being provided for displaying one screen of said image data (fig. 5);

outputting a scanning signal from a scanning signal drive circuit (25 in fig. 15) to said pixel array, said scanning signal being for controlling a timing at which said switching element receives said image signal (col. 18, lines 1-4); and

modulating the value or the amount of said current within said each frame period, said current begin output from said current source (col. 18, lines 34-67).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka et al (US 7,274,363) in view of Hack et al. (US 2002/0030647).

With respect to claim 4, Ishizuka discloses, the display apparatus as claimed in claim 3 (see above).

Ishizuka further discloses generating said control signal input to said current source (col. 18, lines 46-67).

Ishizuka does not expressly disclose a PWM control circuit.

Hack discloses, a PWM control circuit for generating a PWM control signal for, through said drive element, controlling whether or not said light emitting unit emits light, during said each frame period (para. 49); and

a control circuit for, based on said PWM control signal, generating said control signal input to said drive source (para. 49; PWM method will involve measuring/storing OLED current versus PWM amount).

Hack and Ishizuka are analogous art because they are both from the same field of endeavor namely current detection and driving circuitry of flat panel displays.

At the time of the invention it would have been obvious to one of ordinary skill in the art to control the pixels via PWM and to alter the current source of Ishizuka as taught by Hack.

The motivation for doing so would have been to for well-known benefit of increased display uniformity as individual pixel element differences are not as noticeable.

8. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka et al (US 7,274,363) in view of Kimura et al. (US 6,518,962).

With respect to claim 6, Ishizuka discloses, the display apparatus as claimed in claim 5 (see above).

Ishizuka further discloses generating said control signal input to said current source (col. 18, lines 46-67).

Ishizuka does not expressly disclose that the control circuit calculates a luminance level of the image data.

Kimura discloses, wherein a control circuit (21b, 18 in fig. 10) calculates a luminance level of image data (col. 35, line 66 – col. 36, line 17) for each frame period (207 in fig. 17) based on a value or an amount of current (output of 16' in fig. 17) and,

based on said luminance level of said image data for said each frame period (col. 36, lines 4-15), generating a control signal (output of 209 in fig. 17) input to a driving source (200a in fig. 17).

Kimura and Ishizuka are analogous art because they are both from the same field of endeavor namely EL control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to calculate the luminance level and to alter the current source of Ishizuka as taught by Kimura.

The motivation for doing so would have been to correct for deterioration over time thereby achieving a higher quality display for a longer period of time (Kimura; col. 1, lines 65-67).

With respect to claim 7, Ishizuka discloses, the display apparatus as claimed in claim 5 (see above).

Ishizuka further discloses generating said control signal input to said current source (col. 18, lines 46-67).

Ishizuka does not expressly disclose that the control circuit calculates a degree of degradation of the light emitting unit.

Kimura discloses, wherein a control circuit (21b, 18 in fig. 10) calculates the degree of degradation of a light emitting unit (15 in fig. 10) based on a value or an amount of current (Idm in fig. 10) and, based on said degree of degradation of said light emitting unit (col. 36, lines 1-17), generating a control signal (output of 21b in fig. 10) input to a driving source (13, 22a in fig. 10).

At the time of the invention it would have been obvious to one of ordinary skill in the art to calculate the degree of degradation and to alter the current source of Ishizuka as taught by Kimura.

The motivation for doing so would have been to correct for deterioration over time thereby achieving a higher quality display for a longer period of time (Kimura; col. 1, lines 65-67).

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka et al (US 7,274,363) in view of Tsuruoka et al. (US 6,414,443).

With respect to claim 8, Ishizuka discloses, the display apparatus as claimed in claim 5 (see above).

Ishizuka further discloses generating said control signal input to said current source (col. 18, lines 46-67).

Ishizuka does not expressly disclose that the control circuit calculates a temperature of the light emitting unit.

Tsuruoka discloses, wherein a control circuit (35 in fig. 4) calculates temperature of said pixel array based on said value or said amount of said current (col. 4, lines 25-36) and, based on said temperature of said pixel array, generating a control signal (output of 34 in fig. 4) input to a driving source (33 in fig. 4).

Tsuruoka and Ishizuka are analogous art because they are both from the same field of endeavor namely EL control circuitry.

At the time of the invention it would have been obvious to one of ordinary skill in the art to calculate the temperature and to alter the current source of Ishizuka as taught by Tsuruoka.

The motivation for doing so would have been to correct for deterioration over time thereby achieving a higher quality display that is independent of temperature variations (Tsuruoka, col. 2, lines 16-18).

With respect to claim 9, Ishizuka discloses, the display apparatus as claimed in claim 3 (see above)

Ishizuka does not expressly disclose another light emitting unit separate from the array or a control circuit for detecting temperature.

Tsuruoka discloses, a light emitting unit (10' in fig. 4) provided separately from a pixel array (10 in fig. 4); and

a control circuit (35 in fig. 4) for detecting temperature of said another light emitting unit (col. 4, lines 25-36) and, based on said temperature of said another light emitting unit, generating a control signal (output of 34 in fig. 4) input to a driving source (33 in fig. 4).

At the time of the invention it would have been obvious to one of ordinary skill in the art to calculate the temperature and to alter the current source of Ishizuka as taught by Tsuruoka.

The motivation for doing so would have been to correct for deterioration over time thereby achieving a higher quality display that is independent of temperature variations (Tsuruoka, col. 2, lines 16-18).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM L. BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William L Boddie/
Examiner, Art Unit 2629

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art
Unit 2629

5/20/2010